

Applied Math Seminar scheduled on Friday, October 4, 2019, 11-12pm, L01328

Speaker: Dr. Jordan Snyder (University of Washington)

Title: Coarse-graining for coupled oscillators: a case study in discovering low-dimensional dynamics

Abstract:

Numerical simulations form a backbone of modern science. We investigate the following question: given a simulation of some dynamical process, does there exist a good lower-dimensional representation? If so, finding such a representation may offer both computational speedup and fundamental insight into the dynamics of interest. To approach this question in the abstract, we infer coarse-grained equations of motion that describe a heterogeneous population of oscillators with a modular coupling structure. We choose this system because it is known to exhibit a transition from high- to low-dimensional behavior, and that low-dimensional behavior is well-described by equations of a known form. We conclude by exploring ways to move forward by systematically discarding several of the simplifying assumptions at play. Joint work with Andrey Lokhov and Anatoly Zlotnik, Los Alamos National Lab.

About the speaker:

Jordan Snyder is a postdoctoral researcher in applied math at the University of Washington, and is in residence as a visiting scholar at the Fall 2019 IPAM long program on Machine Learning for Physics and the Physics of Learning. Jordan holds a PhD in applied math from UC Davis and a BS in physics and math from Rensselaer Polytechnic Institute.

<https://jasnyder.github.io/>